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A PARASITE OF THE LUNGS OF THE RINGED SEAL

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[p. 32 of the Russian original]

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PARAFILAROIDES KRASCHENINNIKOVI SP. N. A PARASITE OF THE LUNGS OF THE RINGED SEAL (*PUSA HISPIDA KRASCHENINNIKOVI* NAUMOV ET SMIRNOV)

by

M. V. Yurakhno and A. S. Skryabin

(Crimean Pedagogical Institute)

This article is devoted to a description of a new species of nematode of the genus *Parafilaroides* Dougherty, 1946 (family Filaroididae) that has been found in the lungs of ringed seal from the Bering and Chukchee seas.

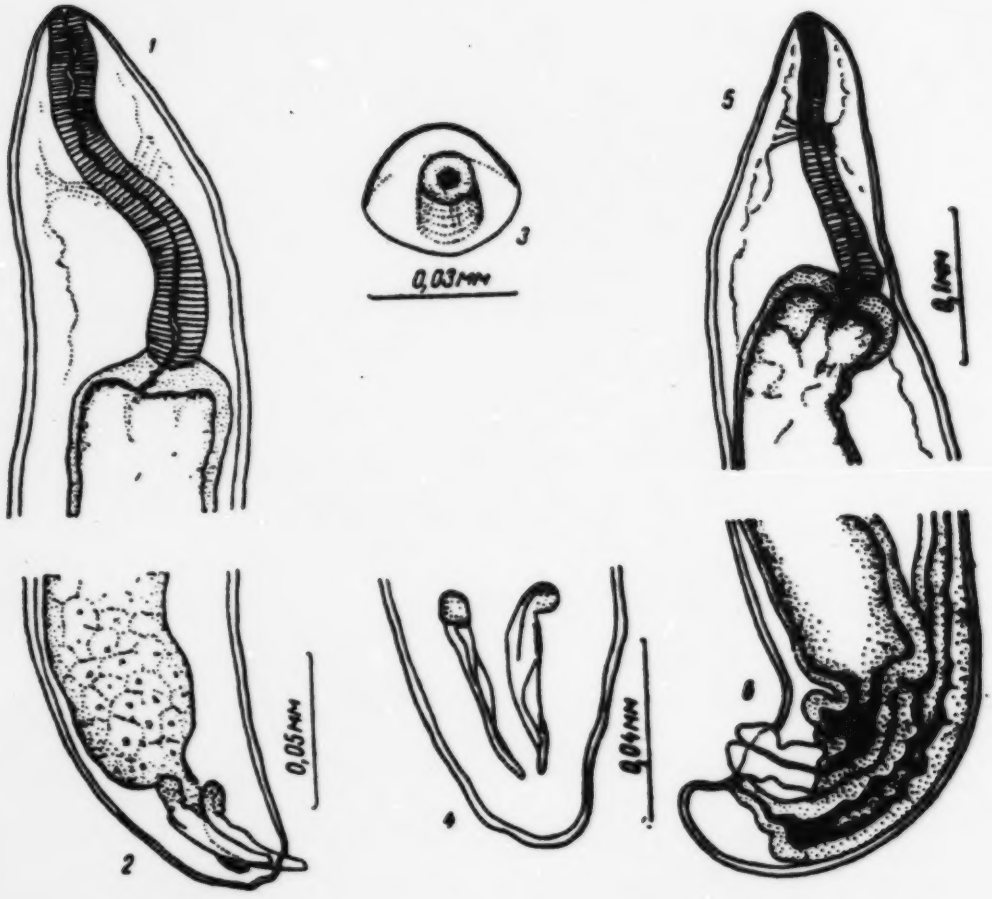
***Parafilaroides krascheninnikovi* Juracho et A. Skriabin sp. n.**

The holotype (a male) and the paratype (a female) are preserved in the Zoological Museum of the Institute of Zoology, Academy of Sciences, Ukrainian SSR, as No. Ne 5/2, discoveries No. 167 and 181, made on May 26, 1966 and May 31, 1966, respectively, at the settlement of Yandrakinot (Chukotka), *Pusa hispida krascheninnikovi*, ♀, ♂, leg. et det. Yurakhno.

Species Description (based on the holotype and the paratype, fixed in Barbagallo fluid and clarified with lactic acid). Threadlike nematodes, dirty white in color. The cuticle is quite distinct, with a thickness of approximately 0.003 mm. The anterior end does not possess any elements of armament (Fig. 3). The mouth opening is round. The esophagus has the shape of a tube with a triangular lumen. The width of the posterior section of the esophagus is 2.6 – 3 times smaller that the width of the anterior section of the intestine. The female is a bit more than twice as large as the male

Parafilaroides kraschenninnikovi sp. n.

1: the anterior end of the male
2: the tail end of the male, side view
3: the anterior end of the female, subapically
4: the tail end of the male, from below
5: the anterior end of the female
6: the taile end of the female from below



The Male. The length of the body is 12.1 mm; the maximum width is 0.092 mm. The body width is 0.061 mm at the posterior of the esophagus and 0.049 mm at the proximal ends of the spicules. The nerve ring is located at a distance of approximately 0.053 mm from the anterior end. The intestine is not large; its length is 0.121 mm and its maximum width is 0.019 mm. The width of the anterior portion of the intestine is 0.52 mm. The cloaca is located at a distance of approximately 0.01 mm from the tail end. The reproductive system consists of unpaired testes with a width of 0.036 mm, a vas deferens that is 0.042 mm wide, and an ejaculatory duct. Bursa and ribs are absent, nor are there any subthermal papillae at the tail end. The spicules are flattened, thin, and 0.045 mm long with a maximum width of 0.007 mm. The proximal ends of the spicules are porous and obtuse; the distal ends are tapered and they are slightly forked in lateral view. There is an accessory organ that is 0.013 mm long.

The Female. Fragments of the anterior and posterior ends of the body were studied. The length of the largest of them attained 26.5 mm; the maximum width was 0.185 mm.

The length of a fragment from the anterior portion of the body was 8.6 mm and had a maximum width of 0.150 mm. The body width at the end of the esophagus is 0.116 mm. The nerve ring is located at a distance of 0.072 mm from the anterior end. The diameter of the mouth opening is 0.004 mm. The length of the esophagus is 0.178 mm and the maximum width is 0.021 mm. The width of the anterior portion of the intestine is 0.063 mm. The length of the anterior portion of the body of the fragment being described is 14.3 mm and the width at the vulva is 0.108 mm. The anus is located at a

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distance of 0.032 mm from the tail end. The reproductive system consists of paired ovaries, oviducts, and utera, and of an unpaired vagina and vulva. The ovaries are located in the anterior half of the body. They initially have the shape of thin tubes with a diameter of 0.028 mm, with grainy structure; they extend forward towards the anterior end and then, at a distance of 0.156 mm from the end of the esophagus, where their diameter gradually increases from 0.064 mm to 0.080 mm, they turn back. The terminal portions of the ovaries are filled with developing egg cells located in a single row and attaining dimensions of 0.052 – 0.080 X 0.032 – 0.042 mm. The ovaries extend into thinner oviducts 0.665 mm long and 0.032 mm wide. Beyond the oviducts are the utera with a diameter of 0.068 to 0.132 mm. The anterior portions of the utera and filled with eggs 0.060 – 0.088 X 0.044 – 0.060 in size, while the posterior portions are filled with larvae 0.296 – 0.331 X 0.012 – 0.014 mm in size. The length of the vagina vera is 0.061 mm. The length of the vagina uterina could not be determined. The vulva is located directly in front of the anus.

Morphological Variation. The new species under discussion is characterized by the variability of individual anatomical and morphological features.

The Male (sizes are presented on the basis of a study of one complete specimen and of three anterior and two posterior body fragments fixed in Barbagallo fluid and clarified with lactic acid). The maximum body width is 0.068 – 0.137 mm. The distance from the nerve

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ring to the anterior end is 0.013 – 0.072 mm. The length of the esophagus is 0.121 – 0.160 mm and the maximum width is 0.013 – 0.019 mm. The length of the spicules is 0.042 – 0.045 mm. The length of the accessory organ is 0.011 – 0.013 mm.

The Female (sizes are presented on the basis of a study of four anterior and three posterior nematode body fragments fixed in Barbagallo fluid and clarified with lactic acid). The maximum body width is 0.150 – 0.190 mm. The distance from the nerve ring to the anterior end is 0.072 – 0.076 mm. The length of the esophagus is 0.178 – 0.180 mm and its maximum width is 0.019 – 0.021 mm. The length of the vagina vera is 0.061 – 0.064 mm.

Material: The nematodes under discussion were found on 25 of 228 animals taken from the Bering Sea for study and on 16 out of 60 taken from the Chukchee Sea. They were localized in the bronchi, bronchiole, and alveoli, penetrating the lung tissue with their anterior ends so that is was difficult to extract them undamaged. We were able to prepare a complete specimen for the male only. The description of the female is based on fragments.

Host: Krasheninnikov's ringed seal (*Pusa hispida krascheninnikovi* Naumov et Smirnov).

Location: the lungs.

Place and Date of Find: Bering Sea, 1966 and 1967; Chukchee Sea, 1966.

A Comparison of the Species of the Genus *Parafilaroides* Dougherty, 1946

Feature	Sex	*P. gymnurus*	*P. decorus*	*P. nanus*	*P. prolificus*	*P. hydrurgae*	*P. caspicus*	*P. arcticus*	*P. kraschenin-nikovi* sp. n.
Body length	♂	15.0 - 18.0	6.0 - 7.0	2.8	–	25.0 - 37.0	7.5 - 7.7	9.196	12.100
	♀	22.0 - 23.0	16.0 - 21.0	4.5 - 5.2	9.0	90.00	–	–	<26.500
Body width	♂	0.12	0.092	0.105	–	–	0.07	0.081	0.068 - 0.137
	♀	0.17	0.165	0.215	0.240	–	0.02	0.073	0.150 - 0.690
Number of papillae around the mouth	♂♀	–	–	–	–	–	–	6	none
Length of esophagus	♂	–	0.120 - 0.125	–	–	0.18	0.12 - 0.13	0.199	0.121 - 0.160
	♀	–	0.155 - 0.170	0.18 - 0.20	0.18 - 0.20	0.25	–	0.102	0.178 - 0.180
Wideth of esophagus	♂	–	0.012	–	–	–	0.02	0.010	0.013 - 0.019
	♀	–	0.021	0.035	0.038	–	–	0.011	0.019 - 0.021
Distance from nerve ring to anterior end	♂	–	0.062	–	–	–	0.06	0.034	0.053 - 0. 072
	♀	–	0.072	–	–	–	–	0.037	0.072 - 0.076
Length of spicules	♂	0.042 - 0.047	0.035	0.039	–	0.055 - 0.060	0.037	0.037 - 0.038	0.042 - 0.045
Length of accessory organ	♂	none	0.010	0.010	–	0.030	none	none	0.011 - 0.013
Subterminal papillae present on tail end	♂	no	yes	no	–	yes	yes	yes	no
Length of vagina vera	♀	–	0.027 - 0.033	0.040 - 0.045	0.040	–	–	–	0.061 - 0.064
Distance from anus to tail end	♀	–	0.018 - 0.023	0.040	0.045	0.030	–	–	0.032
Distance from anus to vulva	♀	–	0.047 - 0.059	0.055 - 0.090	0.065	0.060	–	–	0.003

Note: Dimensions are given in mm; a dash indicates that the data is not available.
Source of data for a given species: *P. gymnurus*, [? Balis and Debin, 1928]; *P. decorus*, Dougherty and Herman, 1947; *P. nanus*, Dougherty and Herman, 1947; *P.prolificus*,Dougherty and Herman, 1947; *P.hydrurgae*, Mawson, 1953; *P. caspicus*, Kurochkin and Zablotskii, 1958; *P. arcticus*, Delyamure and Alekseev, 1966.

Differential Diagnosis. According to the data of Dougherty and Herman (1947), K. I. Skryabin *et al.* (1952), S. L. Delyamure (1955), Yamaguti (1961), and S. L. Delyamure and E. V. Alekseev (1966), the genus *Parafilaroides* Dougherty, 1946 includes seven species. *P. gymnurus* (Railliet, 1899) Dougherty, 1946 is known from the common seal (*Phoca vitulina*) from the waters of Northern Europe. *P. decorus* Dougherty et herman, 1947, *P. nanus* Dougherty et herman, 1947, and *P. prolificus* Dougherty et herman, 1947, were found in California (in the San Diego zoo), the first in the California sea lion (*Zalophus californianus*) and the second and third in the northern sea lion (*Eumetopias jubatus*). *P. hydrurgae* Mawson, 1953 is described as a parasite of the sea leopard (*Hydrurga leptonix*) from the southern zones of the Pacific and Indian oceans (Macquarie Islands and Herd Island). *P. caspicus* Kurotchkin et Zablozky, 1958 was found in the Caspian seal (*Pusa caspica*). *P. arcticus* Delamure et Alekseev, 1966 is described as a parasite of the ringed seal (*P. hispida*) from the Chukchee Sea.

The accompanying table and drawings show that the species we are describing differs from all of the representatives of the genus *Parafilaroides* in the relationship between the width of the esophagus and the width of the anterior portion of the intestine (see the drawing); it differs from all save *P. hydrurgae* in the greater length of the females; from *P. decoris, P. nanus, P. caspicus,* and *P. articus* in in the greater body length of the males and their spicules, and from *P. gymnurus* and *P. hydrurgae* in the shorter body length of the males and their spicules; from *P. gymnurus, P. caspicus* and *P. arcticus* in the appearance of its accompanying organ; from *P. hydrurgae* in its shorter body length and from *P. decorus* and *P. nanus* in its greater body length; from *P. decorus, P. hydrurgae, P. caspicus* and *P. arcticus* in the absence of subthermal papillae at the male's tail end; from *P. decorus, P. nanus* and *P. prolificus* in the greater length of the vagina vera and from them and *P. hydrurgae* in the significantly shorter distance between anus and vulva.

The host and location of this new species are similar to those of *P. arcticus,* but it differs from the latter in the ways enumerated above and also in the absence of armament on the anterior end of males and females, in its broader body, in the length of its esophagus (smaller in the males, larger in the females), in its greater width (true of both males and females), in the distance from the nerve ring to the anterior end, which is twice as great, and in the structure of the distal ends of the spicules.

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The species being described is most similar to *P. gymnurus* in the body length of males and females and in the dimensions of its spicules, but the differences in other respects, enumerated above, indicate that these are different species.

All that has been said permits us to identify the nematodes that we have studies as a separate species of the genus *Parafilaroides,* which we have named *Parafilaroides kraschenninnikovi* in honor of S. P. Krasheninnikov, a leading researcher from Kamchatka.

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